Implementation Status of RIS in Russia
RIS concept itself as well as attendant terminology for the services and applications have not been officially approved by the Ministry of Transport of the Russian Federation. As of today, there are no adopted RIS regulations or any RIS implementation plans, similar to the European IRIS. Nevertheless, Russia supports RIS related UNECE resolutions in the framework of the Working Party on Inland Water Transport (SC.3)

*Mainly traffic related services* are implemented and maintained by the state-operated and state-funded IWW Administrations. Therefore, implementation process is generally smooth.

*Mainly transport related services*, as a rule, are implemented by private bodies, such as shipping companies, port and terminal authorities etc. Process depends on good will and desire for funding. Obviously, nowadays it`s hard to reckon on such good will, thus transport related services are not generally implemented in Russia.

The services defined as “Information for law enforcement”, “Statistics” and “Waterway charges and harbour dues” are implemented and maintained in Russia beyond the framework of RIS concept.

Key RIS technologies - Inland ECDIS and Inland AIS - are being step-by-step implemented. Notices to Skippers and Electronic Ship Reporting are being investigated and tested.
INLAND WATERWAYS OF THE RUSSIAN FEDERATION
15 inland waterway waterways

1. Moscow channel
2. Volga-Baltic waterway
3. Azov-Don waterway
4. Volga-Don waterway
5. Volga waterway
6. White Sea-Onega waterway
7. Kama waterway
8. Yenissei waterway
9. Lena waterway
10. Northern Dvina waterway
11. Ob-Irtysh waterway
12. Ob waterway
13. Pechora waterway
14. Baikal–Angara waterway
15. Amur waterway
<table>
<thead>
<tr>
<th>IWW District</th>
<th>River Information Service</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FIS</td>
</tr>
<tr>
<td><strong>European part of IWW of the Russian Federation</strong></td>
<td></td>
</tr>
<tr>
<td>1. Moscow channel</td>
<td>YES</td>
</tr>
<tr>
<td>2. Volga-Baltic</td>
<td>YES</td>
</tr>
<tr>
<td>3. Azov-Don</td>
<td>YES</td>
</tr>
<tr>
<td>4. Volga-Don</td>
<td>YES</td>
</tr>
<tr>
<td>5. Volga</td>
<td>YES</td>
</tr>
<tr>
<td>6. White Sea-Onega</td>
<td>YES</td>
</tr>
<tr>
<td>7. Kama</td>
<td>YES</td>
</tr>
<tr>
<td><strong>Siberian and Far-East part of IWW of the Russian Federation</strong></td>
<td></td>
</tr>
<tr>
<td>8. Yenissey</td>
<td>YES</td>
</tr>
<tr>
<td>9. Lena</td>
<td>YES</td>
</tr>
<tr>
<td>10. Northern Dvina</td>
<td>YES</td>
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<tr>
<td>11. Ob-Irtysh</td>
<td>YES</td>
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<td>12. Ob</td>
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<tr>
<td>13. Pechora</td>
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<td>14. Baikal-Angara</td>
<td>YES</td>
</tr>
<tr>
<td>15. Amur</td>
<td>YES</td>
</tr>
</tbody>
</table>
The main fields of development and implementation of the RIS technical services / RIS key technologies are:

1. production and distribution of ENCs;
2. expanding of AIS shore network and installation of AIS ship stations;
Inland ECDIS - Electronic Chart Display and Information System for inland navigation

National Inland ENCs are available now for approx. 22000 rkm of the European part of Russian waterways and for approx. 39000 rkm of Siberian and Far East rivers. All Inland ENCs are produced according to S-57 ed. 3.1 Standard and national Regulation Documents for ENCs. Inland ECDIS Standard is not approved in the Russian Federation and is not used for ENC production.

Automatic Identification system AIS

Almost all Russian inland waterways of international importance ("E" waterways) are covered by an AIS shore-based network. But there is no significant AIS shore network in Siberia and Far East. All ships more than 300 gt, all passenger ships and tankers must be equipped with AIS Class A or B (CS, SO) complied with Recommendation ITU-R M.1371. Inland AIS Standard generally is not mandatory for Russian vessels, but is not forbidden.

DGNSS service

All DGNSS reference stations (IALA beacons) transmit corrections for both GLONASS and GPS positioning systems. The latest software also includes Galileo. The average efficient range of DGNSS reference stations is 250 km.
## Main changes since 2011

<table>
<thead>
<tr>
<th>RIS technical services / RIS key technologies</th>
<th>2011</th>
<th>2018</th>
</tr>
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<tbody>
<tr>
<td>ENC, rkm</td>
<td>10 396</td>
<td>19 050</td>
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<tr>
<td>AIS shore-based stations</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>DGNSS reference stations (IALA beacons)</td>
<td>9</td>
<td>15</td>
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</table>
ENC coverage to the end of 2017

National IENCs are available for approx. 22,000 rkm of the European part of Russian waterways and for approx. 38,000 rkm of Siberian and Far East rivers.

All IENCs are produced according to S-57 ed. 3.1 Standard and national Regulation Documents for IENCs.
ENCs coverage of the European part of Russian waterways
ENCs coverage of Siberian and Far East IWW
AIS shore-based stations - 116 in total
Vessel tracking and tracing on Siberian and Far East rivers
Russian inland waterways differs significantly from each other in terms of shipping, such as natural conditions, state and dimensions of fairway, duration of navigation period, traffic and cargo transit capacity, population density and therefore distance between settlements etc.

European part of Russian IWW differs significantly from Asian IWW.

The main conclusions are as follows:

• RIS concept and standards could be implemented only in the Russian inland waterways of international importance ("E" waterways);

• The implementation of RIS is hampered due to lack of adequate national legislative base and long-term process of updating new standards
Testing of the «Real» AIS AtoN on the Volga-Baltic Waterway (2017)
Testing of the «Real» AIS AtoN on the Volga-Baltic Waterway (2017)
Testing of the «Real» AIS AtoN on the Volga-Baltic Waterway (2017)

Position accuracy

Name: TEST ATON  MMSI: 992731001
Readouts, total: 19567  Measuring run duration: 172:26:50
Root-mean-square deviation, m: $\sigma=4,285$ (68.2%)  $2\sigma = 8,570$ (95.4%)
Problem of identification of «Real» AIS AtoNs on narrow fairway
Problem of identification of «Real» AIS AtoNs on narrow fairway
Problem of identification of «Real» AIS AtoNs on narrow fairway
Problem of identification of «Real» AIS AtoNs on narrow fairway
Testing of the Virtual AIS AtoNs network on Ladoga Lake
AIS Shore Station transmits Aids-to-Navigation report (message #21) every 3 min.

3 Virtual AtoN AIS test areas
1st Virtual AtoN AIS test area (Neva river head): 25 virtual AtoNs
2nd Virtual AtoN AIS test area (Vuoksa river outlet): 16 virtual AtoNs
3d Virtual AtoN AIS test area (Svir river outlet): 14 virtual AtoNs
Виртуальный буй 49 (Кошкинский фарватер)
Thank you for your kind attention!

Evgeny Brodskiy
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Saint-Petersburg, Russian Federation

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